# A THEORETICAL BACKGROUND OF THE EMPIRICAL EVIDENCE FOR LINGUISTIC RELATIVITY HYPOTHESIS

Md. Mehedi Hasan*

ABSTRACT

Since the last century the philosophers, anthropologists, psychologists and linguists have been trying to answer whether language influences the way we think or it is our cognition that affects the language we speak. More studies are in favor of the former claim. However, it is important to know about the methodology and findings of the previous research so that on the basis of them further research may be conducted to investigate whether language affects our thought or the other way round. This paper broadly sheds light on the linguistic relativity hypothesis that gave birth to the idea of language affecting human cognition. It also reviews the experiments and observations that took place in this regard and discusses them on the basis of Lucy's (1997) three types of approaches to empirical researches: structure-centered approaches, domain-centered approaches and behavior-centered approaches. The methodology applied in this study is analytic.

**Keywords:** ***Linguistic Relativity, Language, Influence, Cognition, Empirical Evidence***

## 1. INTRODUCTION

Since the last century the philosophers, anthropologists, psychologists and linguists have been trying to answer whether language influences the way we think or it is our cognition that affects the language we speak. They have conducted a lot of experiments to get the answer and produced arguments in favor of their hypothesis; some of them have been successful in convincing us the former view, while some have illustrated their studies such a way that go against the former and make us believe the latter. Two schools of experts have emerged regarding the issue with some exceptions who rather took neutral

*MA student of Applied Linguistics, University of Birmingham, UK, Email: mxh419@student.bham.ac.uk & ellp_2006@yahoo.com

stand in putting forward their claim. Therefore, it has now become a chicken and egg question- which comes first: language or cognition? This concern made me write the paper in which I discussed the approaches followed during the researches to test linguistic relativity hypothesis. I expect that this work will provide remarkable insight into the hypothesis where the influence of language over thought is predominantly a topic of discussion. Also, it will help enrich the theoretical knowledge about it and encourage further research in this field.

### 1.1. **Objectives of the Research**

This study aims to study the methodology of previous studies on the influence of language on our thought or not. This paper also studies the relativity between language and human cognition.

## 2. METHODOLOGY OF THIS STUDY

The methodology applied in this study is descriptive and analytic. Basically, the study reviewed the previous literatures related to influence of language on human cognition. Therefore, this paper is based on the previous available literature found in various sources such as library, online source, published and unpublished MA and PhD thesis. The date found from the available sources have been studied carefully and criticized carefully to find the guest of the research. Mainly, this research is based on secondary sources.

## 3. FINDINGS AND ANALYSIS

### 3.1. **Linguistic Relativity**

First, it is important to clarify what linguistic relativity is. Linguistic relativity is a hypothesis that talks about the correlation between language and thought. A good number of scholars over the centuries brought forth the idea that the language people speak is fundamentally and intimately linked with the cognitive process. Though the concept of linguistic relativity was deeply rooted in Europe (Humboldt in Germany and Saussure in Switzerland and France), it was accelerated by North American anthropologists (Franz Boas and Edward Sapir) who adopted the idea with greater concern to develop (Lucy, 1997). According to Sapir (1929) language influences the way people think, which is later known as *linguistic determinism*, and language has subtle influence on its syntax and semantics that produce differences between languages in the world, which is now known as *linguistic variation*. These two conjectures led to linguistic relativity principle that is uncovered in the writings of Benjamin Lee Whorf (1956). This relativism is also known as *Sapir-Whorf hypothesis* which approaches with its strong version and weak version. The strong formulation pivots on the view that the way we think or act is entirely determined by the language we speak while the weak version sheds light on the concept that our ways of thinking are influenced by the languages we speak. But it is refuted in a sense that if it were true, “we would be prisoners in the prison house of our own language” and we would not be able to think beyond our native language (Kövecses,

2006: 34). On the other hand, the weak version is undergoing theoretical and empirical research nowadays that exposes significant effect of the language on certain non-linguistic thoughts in our everyday life (Gumperz and Levinson, 1996; Levinson, 1996; Lucy 1992b, 1996; Boroditsky 2001, 2003, 2010). However, this linguistic relativity hypothesis was criticized and invalidated extensively by scholars like Heider and Oliver (1972), Devitt and Sterelny (1987), Pinker (1994) because of the negative findings that bred skepticism concerning the likelihood of linguistic influence on thought.

**3.2. Empirical Research**

During 1960s and 1970s, the idea of language influencing thought was about to disappear because of Chomsky's universal grammar hypothesis which says all the human languages in the world are based on the same underlying grammatical structure that overlook the essential linguistic differences. As languages were not thought to be the means of differences then, it was considered illogical to ask whether linguistic differences brought forth differences in thinking (Boroditsky, 2010). However, these differences have now got momentum and the hypothesis of linguistic and non-linguistic effect on cognition is now being tested through empirical researches.

John Lucy (1997) classified existing empirical approachesinto three types: structure-centered approaches, domain-centered approaches and behavior-centered approaches, which is an effort to make linguistic relativity sustainable by means of clarifying how language shapes human thought. Based on Lucy's classification of the approaches (1997), I have categorized evidences found in this field here to evaluate them.

*3. 2.1 Structure-centered approaches*

A structured-centered approach attempts to deal with cross-linguistic differences in terms of their structure of meaning (e.g. observing a structural idiosyncrasy) and study their connection with thought. It analyses structural characteristics embedded on meaning in a language and illustrates its profound effect on reality as an outcome of linguistic behavior (Lucy, 1997). A typical structure-centered approach may be identified in Whorf's (1956) analysis where he shows the dissimilarity between the English speakers and the Hopi speakers in terms of expressing time. English speakers measure or count a day or a year with the same grammatical nouns that are used for ordinary object nouns as if the abstract concept of time is tangible, whereas due to the lack of such grammatical repertoire to express time in their language, Hopi speakers conceptualize time not as countable objects but as recurrent events.

Second example can be Lucy's research (1992b, 1996) on some grammatical structures and their profound influence on cognition in Yucatec Maya (spoken in Mexico) and American English. One of the structures he examined is the plural marker on nouns. It is obligatory in English to mark plurality on all the count nouns, whereas in Yucatec Maya it is optional to mark plurality and if anybody wants to mark it, only the animate count

nouns are marked. As a result, in experimental tasks involving complex pictures, English speakers were sensitive to the number of both animate beings and inanimate objects, while Yucatec speakers were found to be sensitive to number only for animate beings and also less responsive than the English speakers. By this experimental evidence Lucy and Whorf shed light on the view that language is a shaper of our thoughts.

With relation to this, Fausey and Boroditsky (2011) showed that in terms of describing events the Spanish speakers are likely to say "The vase broke itself" instead of saying "John broke the vase" which are more likely to be uttered by the English speakers. In the syntactic structure of the English language, the agent of an event is arranged in the sentences such a way that influences its speakers to remember who did what giving less importance to the pattern of it, whereas some other languages like Japanese or Spanish pay visual attention to "what happened" rather than "who made that happen", which has a powerful impact on the daily habit of perceiving things among its speakers.

Another study in this regard was conducted by Gordon (2004) arguing that there is no morphological system of presenting the distinction between 'one' and 'many' in Pirahã, a language spoken by a tribe living in the Amazon forest, and they failed even in simple one-to-one matching tasks and made numerical errors. This work was in favor of Whorf's strong claim that without number words, human beings cannot identify the exact quantity and rely merely on the approximate quantity.

### *3.2.2 Domain-centered approaches*

A domain-centred approach deals with a specific domain of what one experiences in reality and determines how different languages encode it to find out different linguistic construal that varies between languages (Lucy, 1997). Here, a widely experienced domain prevalent in, more or less, all the languages, i.e. the domain of color, can be considered, and how different languages encode it differently in order to test possible lexical influence on thought can be observed. Most of the scholars who researched in the field of color language have agreed that "the boundaries of color terms vary greatly across languages [and even across individuals speaking the same language] and color languages can make very different distinctions in naming colors" (Kövecses, 2006: 34). But they could not consent to the issue concerning whether linguistic categories influence human perception (linguistic relativity), or the other way round. The followers of Whorfianism, namely Lenneberg (1953), Lenneberg & Roberts (1956, cited in Levinson 2003) and Lucy (1992a) have showed that some colors of a particular language, having some specific and distinctive terms (e.g. red versus vermillion), made the speakers of that language aware of the specificity of the color terminology and helped identify and remember the colors more promptly than others who did not have the category boundary in their language. While experimenting the English and Zuni speakers, this study showed the Whorfian effect of linguistic categories on color cognition. In the experiment English people were more responsive than Zuni speakers in figuring out and memorizing the

lexical codability of the colors. Moreover, the researches undertaken by Kay and Kempton (1984), and Roberson, Davies, and Davidoff (2000) it is shown that the speakers of Tarahumara, who do not differentiate between green and blue, were more accurate than English speakers in figuring out the similarity of color pairs in the blue-green array. With relation to this, Winawer, Witthoft, Frank, Wu, Wade, and Boroditsky, L. (2007) shows that language categories affect color perception in a study where Russian speakers were quicker to distinguish between lighter blues and darker blues (unlike English, in Russian language there is a significant difference between light blues and dark blues) when they were presented as different color categories than when they were presented as similar linguistic category, whereas the English speakers could not show any category advantage as in English there are no separate lexemes for light blue and dark blue.

Now, the domain of space can be taken into account to test the relativity principle. Whorf (1956) thought that the language we use for space is universal, and languages in the world do not vary in terms of space, which results in the same mental representation about space. But he was wrong in his argument as the empirical research carried out in the last forty years in this field proved that languages differ from one another based on the three basic frames of reference. Some languages like English and other European languages use the relative frame of reference (e.g. left-right/ in front of-behind, based on the ego-centric co-ordinates) along with the intrinsic frame of reference (e.g. top-bottom, based on the properties of the reference object). Besides, there are some other languages in the world that use cardinal directions in which objects lie (e.g. east-west, north-south, based on a system of absolute direction independent of the orientation of the reference object) (Levinson 1996, 2003). Now the question arises: Does the difference in languages of spatial representation influence the way we think? An anthropologist, Haviland (1979) and later the famous linguist, Levinson (1996, 1997) answered it. They found that GuuguYimithirr speakers, a remote Australian aboriginal language in North Queensland, do not employ the system of egocentric co-ordinates to describe the position of the objects. Instead of saying “The book is on your left”, “Take the first right” like the way English speakers say using the ego-centric co-ordinates, they tend to point the objects with the geographical co-ordinates: “The football is to the south of your western hand”, “The table is to the east of the chair”. GuuguYimithirr speakers use this system because “there is (effectively) no other system available in the language” (Levinson, 1996:180).

It is very difficult to find out how GuuguYimithirr speakers experience the world differently from the way we do but it is quite evident that their way of thinking, at least in terms of space, does not match with those who think from the body-centered point of view. To speak GuuguYimithirr one has to carry always a mental map in the mind to point everything on the basis of the compass aligned for the four quadrants (Kövecses, 2006). Though it is next to impossible for the speakers of relativistic direction to locate where they are, may be in case of being lost in a jungle or in the sea, using the absolute

orientation because they are trained to ignore directional quadrants while committing information to memory, a speaker of GuuguYimithirr can still spot the location with their traditional frame of reference. (Deutscher, 2010).

In connection with this experiment on GuuguYimithirr, Brown and Levinson (1992, 1993), Levinson and Brown (1994), Pederson, Danziger, Wilkins, Levinson, Kita, and Sneft(1998) investigated the speakers of Tzeltal, a tribal language spoken in the community of Tenejapa and other regions of southeastern Mexico, and showed that they employ the cardinal directions instead of relative frame of reference in performing spatial tasks in which they arranged a sequence of objects using absolute co-ordinates while English speakers reproduced those objects using relative co-ordinates. Another group of native speakers- Arrernte in Australia, also follow the same system of spatial orientation (Levinson, 2003). In all of those studies it was frequently proved that the frame of reference encoded in the language profoundly influence the mental reasoning of spatial relations in the memory.

The language we speak bears a positive influence on how one thinks about abstract domain like time. Time is structured through spatial metaphors (e.g. in English front/ back, forward/ behind, before/ after) (Clark, 1973). It might be represented horizontally that some languages (e.g. English) do or vertically that some other languages do (e.g. Mandarin) (Boroditsky, 2000). We say "Wednesday comes before Thursday", "Our meeting has been moved forward for two days", "Our past haunts us always at the back of our present" etc. In an experiment conducted by Boroditsky (2001) it was found that English speakers answered temporal questions faster after horizontal primes than after vertical primes because horizontal spatial metaphors are greatly prevalent in the English language to think about time, while the Mandarin speakers were faster after vertical primes than after horizontal primes because Mandarin speakers describe time as vertical.

There has been more research carried out in order to test whether the spatial representation of time affects our thoughts. In this regard, Boroditsky and Gaby (2010) traveled to Australia and asked a remote Australian Aboriginal community named Pormpuraaw how they arrange time with their spatial knowledge available in their language. What they found is that Pormpuraawans use cardinal co-ordination like the native speakers of GuuguYimithirr, Tzeltal and Arrernte. But the exclusive finding in the experiment was that Pormpuraawans arrange time from east to west. When facing south, they arranged time from left to right; when facing north, they arranged time from right to left; when facing east, they arranged time as coming toward them; and when facing west, they arranged time as moving away from them. Pormpuraawans were skilled enough to know the absolute frame of reference in order to represent time. Such linguistic evidence necessarily indicates that the spatial imagery formed out of the experience in a particular language constructs temporal representation, which intrigues the habitual thoughts to be relatively influenced. This is the reason why it is likely that the speakers of Mandarin will

represent the future below and the past above, and according to the speakers of Aymara, spoken in South America, the future is behind and the past in front (Boroditsky, 2010).

### *3.2.3 Behavior-centered approaches*

A behavior-centered analysis deals with some practical concern and seeks an explanation in language. It investigates into the issue whether the circumstances, resulting from the everyday behavior, that occur in a particular linguistic system are affected by the language people speak (Lucy, 1997). Whorf (1956) adopted this kind of approach while finding out the reason of fires at a chemical plant, and concluded that it happened because of the use of the word 'empty' among the workers as it was meant to be the barrels containing explosive gas. Several researches have been done in connection with this study. One of the remarkable experiments was conducted by Alfred Bloom (1981, 1984, cited in Lucy 1997) who observed that the speakers of Chinese faced unpredictable difficulties replying counterfactual questions (e.g. questions like What if….?, If only I had ...., etc.). Bloom thought the reason might be in the way counterfactuals were grammatically marked in the Chinese language. He then redesigned his counterfactual reasoning and presented some controlled stories with Chinese translation to the Chinese speakers and the English speakers got the text in English. And then he noticed that the counterfactual marking affected thoughts significantly.

Apart from these three approaches, some experiments were executed to test the linguistic relativity principle, which were more culture bound but primarily resulted from the linguistic effects. In an experiment Boroditsky, Schmidt, and Phillips (2003) show that the way we perceive our world can be influenced by stereotypical mental representation of the grammatical gender marking system in a language. They asked the speakers of German and Spanish to identify the similarities between pictures of people (males and females) and pictures of objects whose names had opposite gender markers in German and Spanish. The result was predictable: both the speakers matched the inanimate objects with either males or females based on the masculine or feminine gender markers available in the two languages. In another experiment, speakers of German and Spanish were asked again to describe various objects that had opposite genders in the two languages. The result showed that for the word *key*, which is meant to be masculine in German and feminine in Spanish, German speakers associated *key* with something that is *hard, heavy, jagged*, whereas according to Spanish speakers key was *golden, intricate, little, lovely*. On the contrary, for the word bridge, which is feminine in German and masculine in Spanish, German speakers described bridge as *beautiful, elegant, fragile*, whereas Spanish speakers said bridge is *big, dangerous, long, strong*.

## 4. CONCLUSION

These empirical evidences are not only pioneering in strengthening the weak claim of the linguistic relativity hypothesis but also an influential in making us think more about how language influences our way of thought. Further research should be done to prove it

again and again so that we can get a firm grounding in favor of Whorf (1956). We are not far from the day when this hypothesis will be an established theory in the field of psycholinguistics.

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